küschall®
designed for life

küschall® Champion

CE

Service Manual

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General

Introduction

This service manual is part of the instructions and contains the technical information for servicing, configuring and repairing a *Küschall*® wheelchair.

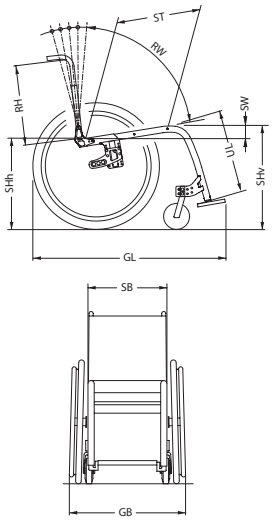
To guarantee the required safety and reliability, all wheelchairs must be comprehensively checked once a year.

In part, assembly and adjustment require extensive experience. For this reason, the following assembly instructions have been split into three categories:

Requirement	Symbol
Easy – technical understanding required	●○○
Intermediate – specialist knowledge required	●●○
Difficult – specialist wheelchair assembly knowledge and experience required	●●●

The required tools and their respective sizes are listed above each instruction.

Tools	Symbol
Allen key	⬢ 2x3, 4, 5, 6
Phillips screwdriver	✖2
Straddle spanner	▬C 19
Socket spanner/ring spanner	⬡ 8, 10, 14, 22

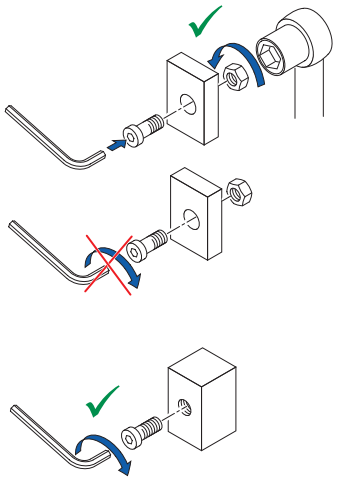


Spare parts and adaptations

All spare parts can be purchased from *Küschall*®'s Customer Services. An electronic spare parts catalog is available by logging onto *www.kueschall.com*. Only original spare parts may be used. Installing additional adaptations to a *Küschall*® wheelchair requires the prior written approval of *Küschall*® AG.

Tightening Allen screws

Allen keys are not designed for greater forces. When tightening or loosening an Allen screw, it is therefore advisable to apply force to the nut to prevent the hexagon socket from being damaged.



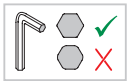
Tightening and loosening

- Turn the nut with a socket spanner (only use a straddle spanner if there is insufficient space) and merely hold the screw tight with the Allen key.

Tightening and loosening if there is no nut

If an Allen screw is directly screwed into a screw thread, the screw must be tightened using an Allen key.

Ensure that the Allen key is of good quality and not worn.



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Torque

- All screw connections must be tightened with the torques specified in the following instructions. Adhering to the given torques requires the use of a torque spanner.

Checks

Visual check

- Check the entire frame for cracks, especially the areas around joints and welded seams.

Checking the screw connections

- Check all screw connections with the torques specified in the instructions.

⚠ **Several screw connections have been secured with safety seals. If these are opened, they must be secured again using new safety seals.**

Identifying and alleviating malfunctions

Malfunction	Possible cause	Measure
The wheelchair will not move in a straight line	Incorrect tire pressure in a rear wheel	Correct tire pressure
	One or more spokes broken	Replace defective spoke(s)
	Spokes unevenly tensioned	Tighten excessively loose spokes
	Dirty or damaged wheel bearings	Clean or replace bearings
	Bearing block of castor fork is not vertical	Align bearing block vertically
	Front wheels not set to the same height	Position the front wheels in such a way that they touch the ground at the same time
	Rear wheels not parallel or axes not aligned	Adjust the prestress load on the scissor mechanism and/or the trail
The wheelchair tips backwards too easily	Rear wheels have been fitted too far forward	Fit rear wheels further back
	Backrest angle too great	Reduce backrest angle
	Seat angle too great	Mount the adapter plate lower on the side profile
		Mount the smaller castor fork
The brakes engage poorly or asymmetrically	Incorrect tire pressure in one or both rear wheels	Correct tire pressure
	Brake setting incorrect	Correct brake setting
Roll resistance is too great	Insufficient tire pressure in the rear wheels	Correct tire pressure
	Rear wheels are not parallel	Ensure that the rear wheels are parallel (4° wheel camber)
The front wheels wobble when moving fast	Insufficient tension in the front wheel bearings block	Lightly tighten the nut in the bearings block axle
	Front wheel is worn flat	Replace front wheel
The front wheel is stiff or stuck	Dirty or damaged bearings	Clean or replace the bearings
The wheelchair is very difficult to unfold	The backrestcover is too tight	Loosen the backrestbands a little
Handling seems imprecise	The scissor mechanism is not closed properly	If required, remove dirt from scissor mechanism
	The scissor mechanism is misaligned	Realign the scissor mechanism

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Frame

The Champion 08 frame is available in aluminium, titan or carbon. Aluminium or titan frames are available with frame angles of 75° and 90°, carbon frames with a frame angle of 87°

Changing Frame

Fitting frame tubes

- Fit both frame tubes into the side supporters① using bolts ② and tighten lightly.

When assembling the titan frames, make sure an aluminium spacer sleeve ④ is placed between frame tube ③ and side supporter.

Drilling frame mounting holes

Difficulty: ●●● *Tools: drill, drill bit: ∅ 5,9 mm*

- Before drilling the frame mounting holes, fit and adjust the following components:

- Front wheels, → **Chapter Front wheels;**
  ‹Front wheels, repositioning to the frame›
  ‹Front wheel supporter, adjusting the steering error angle›
  ‹Front wheel supporter, adjusting the trail angle›
- Footrests, → **Chapter Footrests;**
  ‹Footrest, height adjustment›
- Adapter sleeves, Distance sleeves, Adapterplates,
  → **Chapter Rear Wheels;**
  ‹Adjustment of rear wheel parallelism›
  ‹Adapterplate, adjustment to folding unit or assembly of new adpterplate›
  ‹Adapterplate spacer assembly›
- Seat cover, → **Chapter Seat;**
  ‹Fitting seat cover to frame›

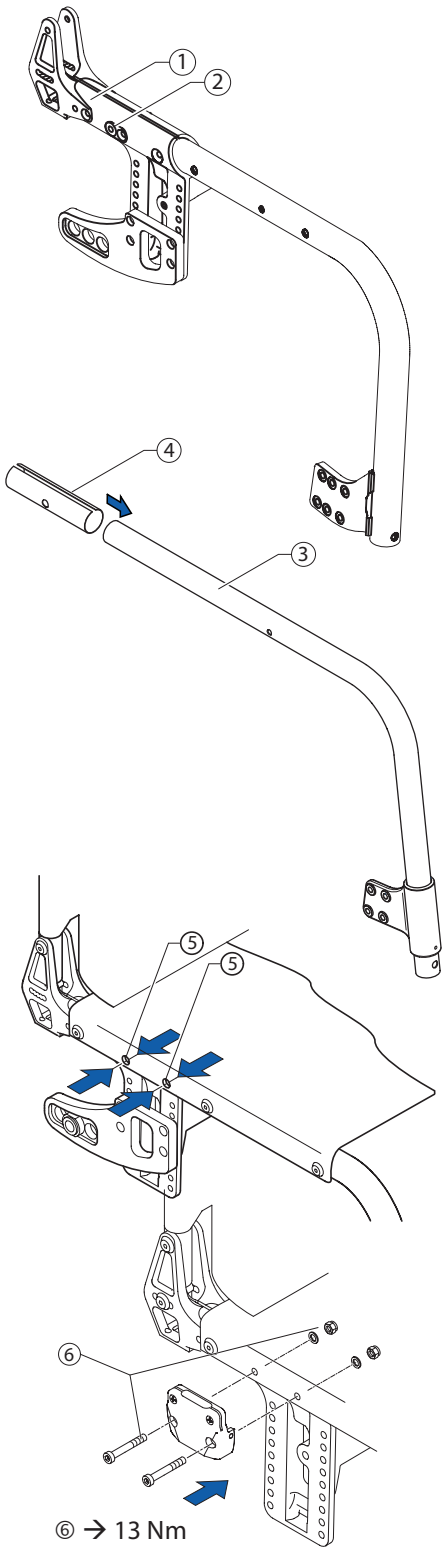
Make sure that all settings on the wheelchair are correct. To guarantee that the wheelchair runs straight, make sure that the frame is parallel and in plumb.

- Drill the frame mounting holes ⑤ carefully on both sides through the side supporters and the seat cover from the inside out to ∅ 5.9 mm.

Attaching the side supporters, frame tubes and seat cover

The purpose of the threaded connection through the frame mounting holes is to provide additional fixing. The frame is thus easier to guide and is better secured. Any misalignment of the toe angle of the front wheels is counteracted.

- Attach the side supporters, frame tubes, seat cover and optionally, the holders for the mudguard or siderests using bolts through the frame mounting holes ⑥ on both sides and tighten.



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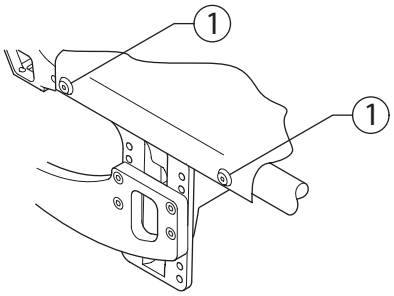
Seat

Fitting seat cover to frame

■ Fit seat cover to side supports on both sides using bolts ①.



Front seat height (SHv)

The following possibilities are available to adjust the front seat height (SHv):

- Replace the front wheel with a larger or smaller one,
  → **‹Chap. Front wheels; Replacing a front wheel›.**
- Replace the front fork with a larger or smaller one,
  → **‹Chap. Front wheels; Replacing a front wheel fork›.**

Adjusting the front seat height changes the seat angle. It may be necessary to adjust the rear seat height correspondingly.

In the case of a 4° wheel camber, it must be ensured that the rear wheels are parallel after changing the front seat height.
If required, they must be readjusted,
→ ‹Chap. Rear wheels; Adjustment of rear wheel parallelism›.

Front seat height (SHv) per frame size, front fork and front wheel

	Aluminium / Titan frame 75° (active)											
	(short frame)						*(long frame)*					
SHv [mm]	5"	5"	6"	6"	8"	8"	5"	5"	6"	6"	8"	8"
450		●5"	●4"	●3"			●3"					
460			●5"	●4"	●3"		●4"	●3"				
470			●5"	●4"	●3"			●4"	●3"			
480			●6"	●5"	●4"	●3"		●4"	●3"			
490				●6"	●5"	●4"		●5"	●4"	●3"		
500					●6"	●5"			●5"	●4"	●3"	
510						●6"			●6"	●5"	●4"	●3"
520						●6"				●6"	●5"	●4"
530										●6"	●5"	●4"
540											●6"	●5"

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Front seat height (SHv) per frame size, front fork and front wheel												
	Aluminium / Titan frame 90° (dynamic)											
	(short frame)						(long frame)					
SHv [mm]	5"	5"	6"	6"	8"	8"	5"	5"	6"	6"	8"	8"
450		4"	3"									
460		5"	4"	3"			3"					
470			5"	4"	3"		4"	3"				
480			5"	4"	3"			4"	3"			
490				5"	4"	3"		4"	3"			
500					5"	4"		5"	4"	3"		
510						5"			5"	4"	3"	
520										5"	4"	3"
530										5"	4"	3"
540											5"	4"

Front seat height (SHv) per frame size, front fork and front wheel						
	Carbon frame 87°					
	UL 400 – 500					
SHv [mm]	5"	5"	6"	6"	8"	8"
450	3"					
460	4"	3"				
480		4"	3"			
490		5"	4"	3"		
500			5"	4"	3"	
510				5"	4"	3"
520					5"	4"
530					5"	4"
540						5"

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Rear seat height (SHh)

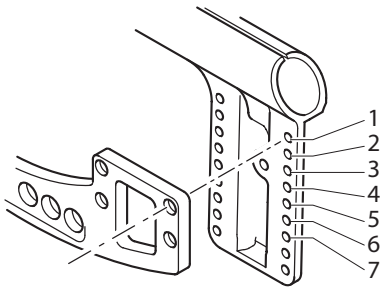
The following possibilities are available to adjust the rear seat height (SHh):

- Adjustment of the adapter plate to the folding unit, → **Chap. Rear wheels; ‹Adapterplate, adjustment to folding unit or assembly of new adapterplate›.**
- Replacement of the rear wheel with a larger or smaller one.

In the case of a 4° wheel camber, it must be ensured that the rear wheels are parallel after changing the rear seat height, If required, they must be readjusted,
→ Chap. Rear wheels; ‹Adjustment of rear wheel parallelism›.

Rear seat height (SHh) by position in the adapter plate and rear wheel size

SHh [mm]	*22" wheel*	*24" wheel*	*26" wheel*
390	3	1	
400	4	2	
410	4	2	
420	5	3	1
430	6	4	2
440	7	5	3
450		6	4
460		6	4
470		7	5
480			6
490			7



Assumption: Seat angle=60 mm

Folding unit

Setting the scissor mechanism

Both scissor levers must be fully on top of each other. It is important that there is no play. The scissor mechanism must open and close easily.

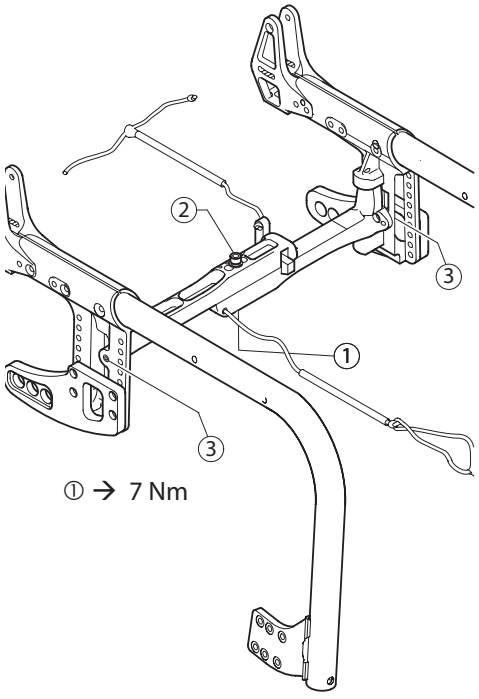
Difficulty: ●●○ *Tools:* ⬢6 ⬡14

If the scissor mechanism is loose or if there is play in the scissor levers:

- Loosen the counternut ①.
- Tighten the screw ② and then loosen it by a quarter turn.
- Tighten the counter nut ①. Hold the screw ② tightly whilst tightening.

If the scissor mechanism is too stiff:

- Loosen both counter nut ① and screw ② slightly.
- Tighten the counter nut ① again.



Check:

Always ensure that the screws ③ are tightened in such a way that they are seated on the scissor mechanism when it is open. Please note that the screws ③ are secured with adhesive and this must be replaced as appropriate.

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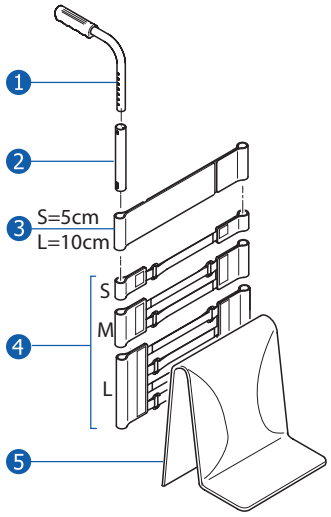
Backrest

Tension adjustable backrest

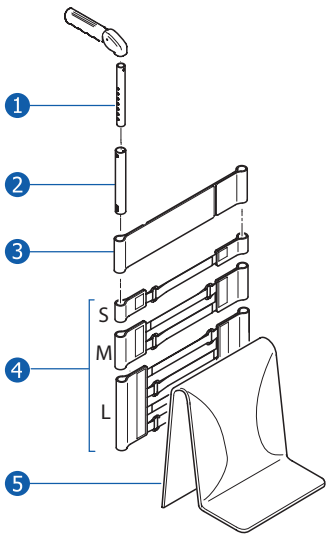
Tension adjustable backrest with push handles standard

RH [mm]	Push-handle ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	Velcro straps without stabili-sation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	S	S	L	M	not possible		S
315	S	S	L	M			S
330	S	S	L	S+M			S
345	S	L	L	S+M			M
360	S	L	L	S+M			M
375	S	L	L	L			M
390	S	L	L	L			M
405	L	L	L	L	S	S+L	L
420	L	L	L	S+L	S	S+L	L
435	L	L	L	S+L	S	S+L	L
450	L	L	L	S+L	S	M+L	L
465	L	L	L	S+L	S	M+L	L



Tension adjustable backrest with foldable push handles

RH [mm]	teles-copic tube ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	Velcro straps without stabili-sation bar ❹	Velcro straps with stabilisation bar	❺
300	S	S	L	M	not possible	S
315	S	S	L	M		S
330	S	L	L	S+M		S
345	S	L	L	S+M		M
360	S	L	L	S+M		M
375	S	L	L	L		M
390	L	L	L	L		M
405	L	L	L	L		L
420	L	L	L	S+L		L
435	L	L	L	S+L		L
450	L	L	L	S+L		L
465	L	L	L	S+L		L



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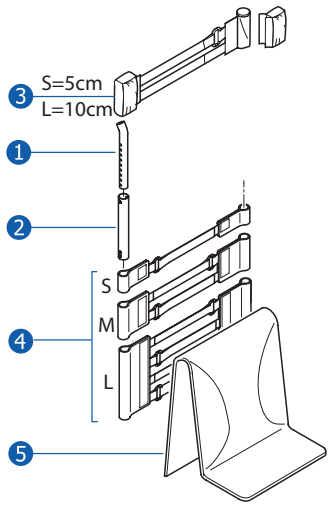
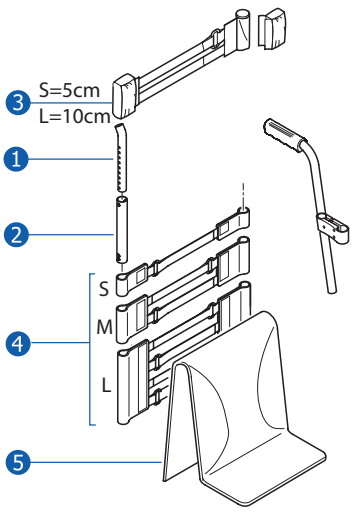
Tension adjustable backrest without push handles

RH [mm]	teles-copic tube ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	Velcro straps without stabili-sation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	S	S	L	M	not possible		S
315	S	S	L	M			S
330	L	S	L	S+M			S
345	L	S	L	S+M			M
360	L	S	L	S+M			M
375	L	L	L	L			M
390	L	L	L	L			M
405	L	L	L	L	S	S+L	L
420	L	L	L	S+L	S	S+L	L
435	L	L	L	S+L	S	M+L	L
450	L	L	L	S+L	S	M+L	L
465	L	L	L	S+L	S	M+L	L



Tension adjustable backrest with rearset push handles height adjustable

RH [mm]	teles-copic tube ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	Velcro straps without stabili-sation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	S	S	S	M	not possible		S
315	S	S	S	M			S
330	S	L	L	M			S
345	S	L	L	M			M
360	S	L	L	S+M			M
375	S	L	S	L			M
390	L	L	S	L			M
405	L	L	S	S+L	S	2S+M	L
420	L	L	L	L	S	2S+M	L
435	L	L	L	L	S	S+L	L
450	L	L	L	S+L	S	S+L	L
465	L	L	L	S+L	S	S+L	L



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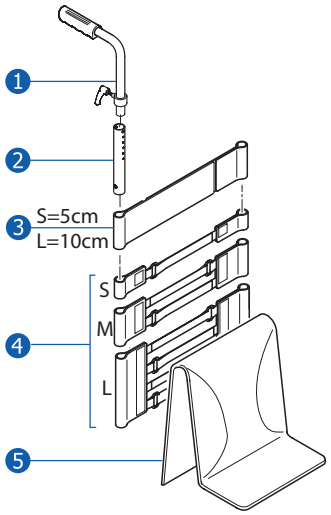
Tension adjustable backrest with push handles, height adjustable

RH [mm]	*Push-handle* ❶	*Backrest-tube* ❷	*Velcro straps without stabilisation bar* ❸	*Velcro straps without stabilisation bar* ❹	*Velcro straps with stabilisation bar* ❸	*Velcro straps with stabilisation bar* ❹	❺
300	S	different for every backrest height	L	M	not possible		S
315	S		L	M			S
330	M		L	S+M			S
345	M		L	S+M			M
360	M		L	S+M			M
375	M		L	L			M
390	M		L	L			M
405	L		L	L	S	S+L	L
420	L		L	S+L	S	S+L	L
435	L		L	S+L	S	S+L	L
450	L		L	S+L	S	M+L	L
465	L		L	S+L	S	M+L	L



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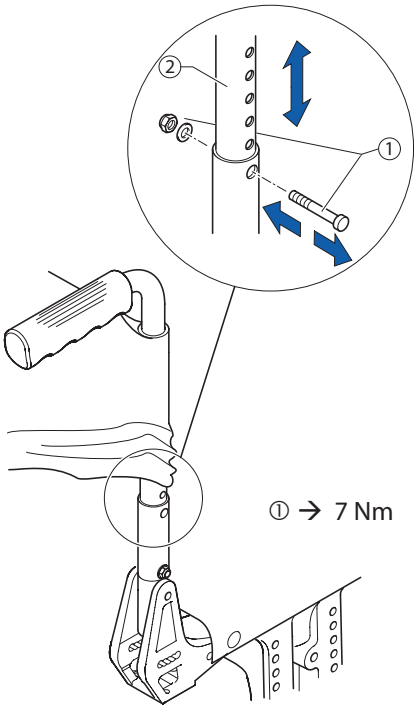
Backrest height (RH)

In order to adjust the backrest height (RH), the backrest tubes have to be fixed in a different position or they have to be exchanged.



Standard backrest cover, height adjustment

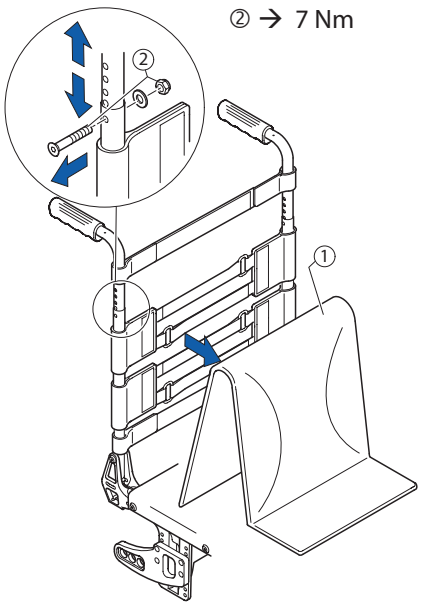
Difficulty: ●○○ *Tools:* ⬢ 3 ⬡ 8

- Push the backrest cover so that bolt and nut on the backrest tube are revealed.
- Remove bolt and nut ①.
- Adjust the backrest tube ② to the required height then insert the screw ① into the closest hole and tighten it again.
- Carry out the same setting on both sides.
- Reposition the backrest cover correctly.

Tension adjustable back, height adjustment

Difficulty: ●○○ *Tools:* ⬢ 3 ⬡ 8

- Remove the backrest cover ①.
- Slide the backrest straps either up or down to locate the fixing bolt ②.
- Remove bolt and nut ②.
- Adjust the backrest tube to the required height then insert the screw ② into the closest hole and tighten it again.
- Carry out the same setting on both sides.
- Reposition the backrest cover.



In the case of major changes of the backrest height (RH), bands may have to be inserted or removed and a larger/smaller backrest cover may be necessary.

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Backrest angle (RW)

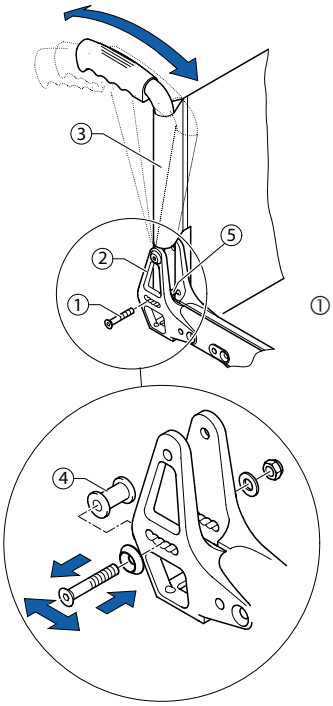
Backrest, angle adjustment

Difficulty: ●●○ *Tools:* ⬢4 ⬡10

- Remove the lower bolt ① from the side supporter ② and move the backrest ③ to the required position. The spacer ④ remaines fixed in the latch bolt ⑤.
- Insert bolt and nut ① into the closest hole and tighten it again.
- Carry out the same setting on both sides.

Function control:

The backrest must fold easily and the ratchet bolt must sit tightly against the side supporter.



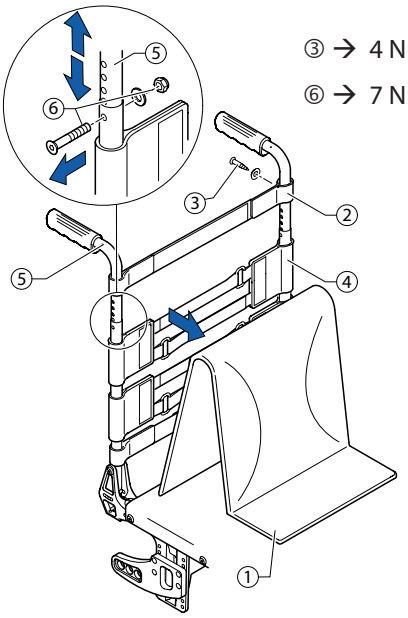
① → 7 Nm

Push handles / backrest telescopes

Push handle / telescopic tube replacement

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Remove the backrest cover ①.
- Remove the screws ③ holding the uppermost backrest band ② (or standard backrest cover) to the push handles ⑤ (or telescopic tubes).
- Slide the backrest straps ④ (or standard backrest cover) either up or down to locate the fixing bolt ⑥.
- Remove bolts and nuts on both sides ⑥.
- Remove push handles ⑤ (or telescopic tubes).
- Slide new push handle through backrest band ② and fix it on the backrest with bolt ⑥.
- Fix the upmost backrest band ② (or standard backrest cover) with screws ③.
- Carry out the same setting on both sides.
- Reposition the backrest cover correctly.



③ → 4 Nm
⑥ → 7 Nm

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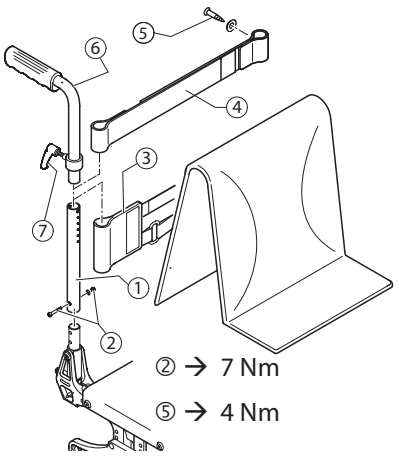
Height adjustable integrated push handles

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Fit the backrest tube ① corresponding to the desired backrest height (RH) on both sides using the bolt ②.
- Slide the backrest bands ③ corresponding to the desired backrest height (RH) and, if required, the end band ④ (or the standard backrest cover) over the backrest tube ①.
- Slide the push handle ⑥ into the backrest tube ① on both sides and secure it at the desired height using the clamp bolt ⑦.
- Secure the end band ④ (or the standard backrest cover) to the backrest tube ① on both sides using the screws ⑤.



Height adjustable rear set push handles

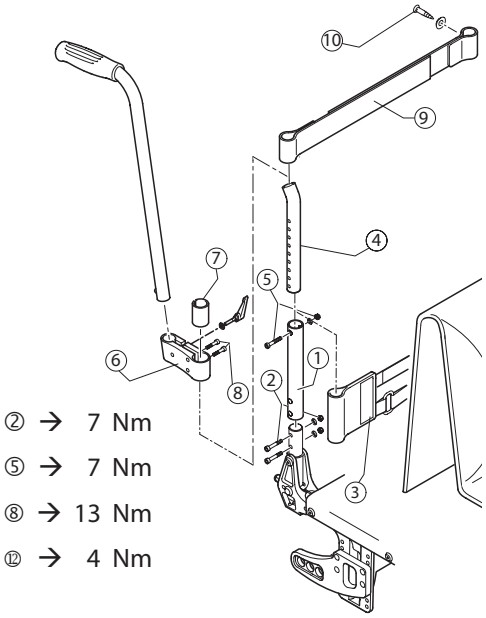
These push handles can only be used in combination with adjustable backrests, not with standard backrests.

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Fit the intermediate tube ① on both sides using the bolts ②.
- Slide the backrest bands ③ corresponding to the desired backrest height (RH) onto the intermediate tube ①.
- Fit the telescopic tube ④ corresponding to the desired backrest height (RH) on both sides using the bolt ⑤.
- Slide the holder ⑥ and the sleeve ⑦ onto the telescopic tube ④ and secure it using the screws ⑧.

For the minimum backrest height, the holder of the rear set push handle must be fitted to the intermediate tube ①. In this case, the sleeve ⑦ is not required.

- Slide the end band ⑨ onto the telescopic tube ④ and secure it on both sides using the screws ⑩.



Replacing foldable push handles

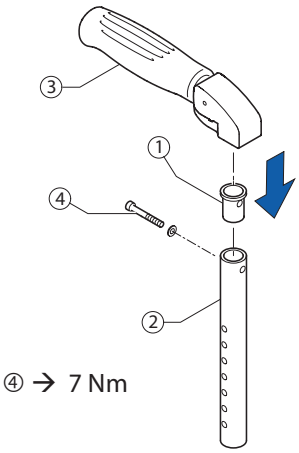
Difficulty: ●○○ *Tools:* ⬢4

- Remove the old foldable push handle and the old threaded sleeve.
- Slide the new threaded sleeve ① onto the telescopic tube ②.

For safety reasons, it is important that a new threaded sleeve is used and that the old sleeve is not left in, and reused for, the telescopic tube.

- Slide the new foldable push handle ③ onto the telescopic tube ②.
- Fix the foldable push handle with the screw ④.

The telescopic tube must be replaced as well, if no foldable push handle has been fitted and a foldable push handle is to be newly fitted.



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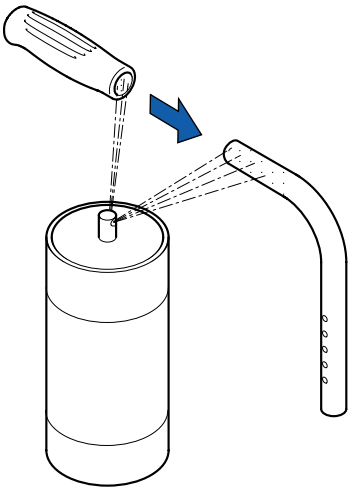
Replacing the handle

An adhesive (e.g. hair spray) is used in these instructions. When applied to the handle, this substance works as a lubricant and as an adhesive once dry.



After drying, the adhesive used must be able to resist a pull-off force of 750 N. If in doubt, contact *Küschall*® AG.

Difficulty: ●●○

- Remove the old handle.
- Remove any residue (residual adhesive, grease, dust) from the push handle tube.
- Apply a thin layer of hair spray all over the surface of the push handle tube onto which the handle is to be slid.
- Apply a thin layer of hair spray to the inside of the handle.
- Slide the new handle onto the push handle tube.
- Move the handle into the correct position (grooves facing upwards).

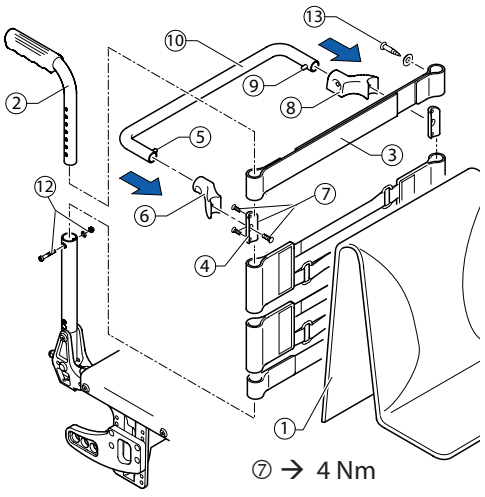
If a long handle has been fitted and this is to be replaced with a short one, the push handle tube must be shortened by 35 mm. The push handle tube must be replaced when switching from a short to a long handle.

Stabilisation bar

Stabilisation bar assembly

Difficulty: ●●○ *Tools:* ●3 ⬡8 ✖2

With a back height RH405 or larger it is possible to assemble a stabilisation bar to increase the rigidity of the backrest handles.



- Remove backrest cover ①, push handles ② and 10 cm backrest band (or end band, if no push handles are assembled).
- Assemble a 5 cm backrest band ③ or end band with the screws ⑬ to the push handles ②.
- Assemble the push handles ② with bolts and nuts ⑫.
- Attach the clamps ④ together with the RH socket ⑥ and the LH socket ⑧ with the screws ⑦ below the backrest band ③ to the push handles ②.
- Replace the push handle/backrest band/socket assembly.
- Press pin ⑤ and slide the stabilisation bar ⑩ into the RH socket ⑥ then swing the stabilisation bar upwards, press pin ⑨ and click the stabilisation bar into the LH socket ⑧.

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Footrests

Lower leg length (UL)

To change the lower leg length, the footrest can be fixed at a higher or lower position, → **Chap. Footrests, ‹Footrest, height adjustment›.**

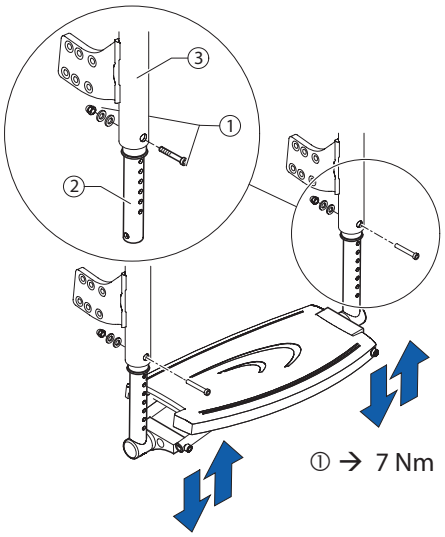
Short lower leg lengths (UL) can be set using a high-mounted footrest, → **Chap. Footrests, ‹Footrest mounted in high position›.**

Aluminium frame:	UL220 – UL310	high mounted footrest
	UL320 – UL390	standard footrest, short frame
	UL400 – UL500	standard footrest, long frame
Titan frame:	UL220 – UL340	high mounted footrest
	UL360 – UL390	standard footrest, short frame
	UL400 – UL500	standard footrest, long frame
Carbon frame:	UL300 – UL340	high mounted footrest
	UL400 – UL500	standard footrest

Footrest, height adjustment

Difficulty: ●○○ *Tools:* ⬢4 ⬡8

- Remove on both sides bolt and nut ①, which fix the telescopic tube ② to the frame ③.
- Extend the footrest telescope ② to the required length, then insert the bolts ① into the closest holes.
- Carry out the same setting on both sides.
- Tighten the locking bolts ① on both sides.



Function control

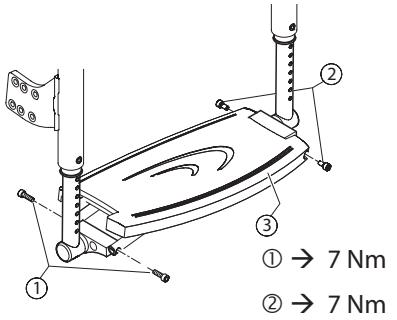
Check that the footrest is firmly attached but that it can fold easily.

Footplate

Footplate replacement

Difficulty: ●○○ *Tools:* ⬢4 ⬡8

- Remove the screws ① and the screws ②.
- Remove the footplate ③ and replace it by the new one.
- Attach the footplate ③ with the screws ① and the screws ②.



Function control

Check that the footrest is firmly attached but that it can fold easily.

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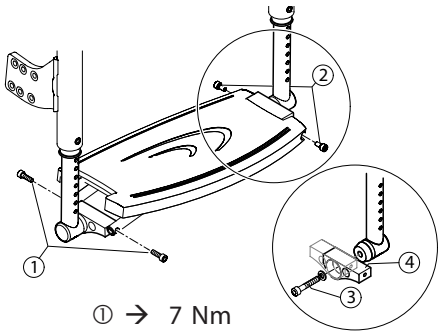
Fitting the footplate set to the front

The footplate is fitted set back as standard.

Difficulty: ●●○ *Tools:* ⬢ *4, 5*

- Remove the screws ① and the screws ②.
- Remove the screws and washers ③ on both sides.
- Rotate the footplate mounting ④ by 180°. The elongated side of the footplate mounting ④ is now pointing forwards.
- Fit the footplate mounting ④ again using the screws and washers ③.
- Secure the footplate using the screws ① and the screws ②.
- Set the desired footplate angle and tighten the screws ③, → **Chap. Footrests, ‹Angle adjustment of the footplate›**.



① → 7 Nm
② → 7 Nm
③ → 7 Nm

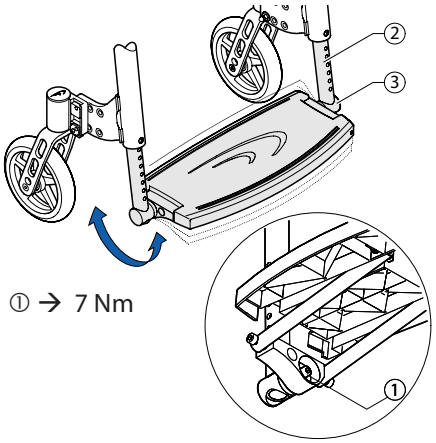
Function control

Check that the footrest is firmly attached but that it can fold easily.

Angle adjustment of the footplate

Difficulty: ●○○ *Tools:* ⬢ *5*

- Slightly loosen the bolts ① under the footplate which secure the telescopic tube ② to the footplate mounting ③.
- Set the footplate to the desired angle.
- Tighten the bolt ① on both sides.



① → 7 Nm

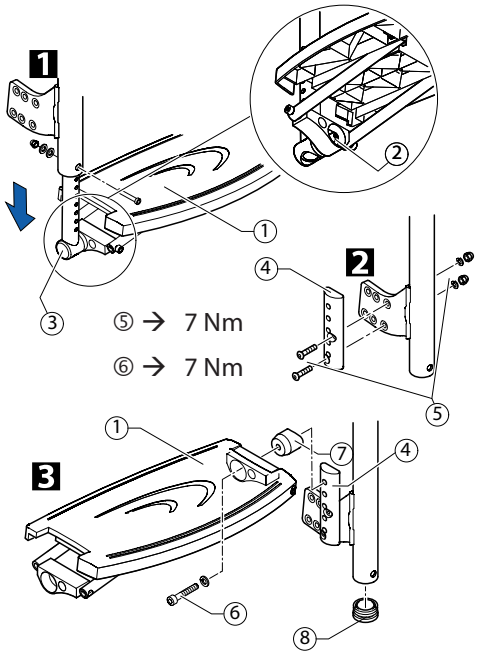
Function control

Check that the footplate can fold easily.

Footrest mounted in high position

Difficulty: ●●○ *Tools:* ⬢ *4, 5* ⬡ *10*

1. Remove the footrest from the frame.
- Detatch the telescopic tube and footplate fixture ③ from the footrest ① by removing the screw ②.
2. Attach the mounting bracket ④ to the frame using the screws and nuts ⑤ in the holes which are the closest to the frame.
3. Attach the footrest ① at the desired height on the mounting brackets ④ with the screws ⑥ and the conical spacers ⑦.
- Fit caps ⑧ to the ends of the frame.
- Carry out the same setting on both sides.



⑤ → 7 Nm
⑥ → 7 Nm

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Side parts

Clothes-guard assembly

Difficulty: ●●○ *Tools:* ⬢4 ⬡10

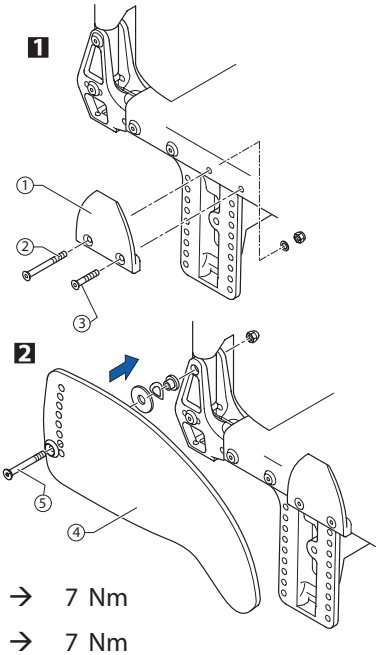
1 Attach the seat module fixation piece ① to the seat module with bolt and nut ② and screw ③ to the frame.

■ Align the clothes guard ④ to the rear wheel and note the best hole on the clothes guard to fix it to the backrest hinge.

2 Remove backrest hinge screw ⑤ then re-assemble together with the clothes guard ④.

Function control:

Fold and unfold the backrest (this must be done easily). Make sure the clothes-guards are positioned slightly higher than the rear wheels. Check that the clothes-guards flip up easily.



② → 7 Nm
③ → 7 Nm
⑤ → 7 Nm

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Mud guard assembly

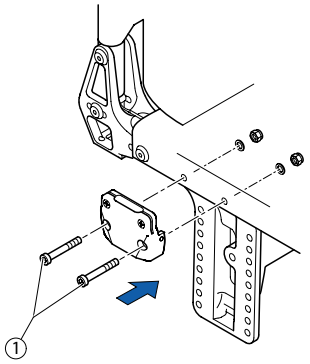
Difficulty: ●●○ *Tools:* ⬢ 3, 4 ⬡ 10 ✖ 2

If replacing a clothes guard with a mudguard, first remove the clothes guard and the bracket attached to the seat module.

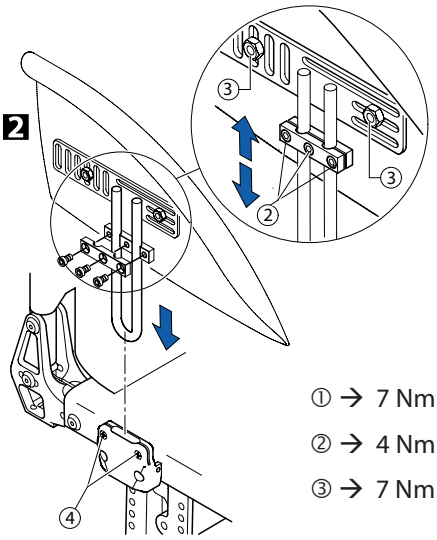
1. Attach the bracket to the seat module with the screws ① and remount the rear wheels.
2. Slightly loosen the three screws ② on the adjustment plate and move it along the mounting bracket until the mudguard is in position.
- The position of the mudguard can also be adjusted: To do this, loosen the bolts ③, adjust the mudguard position as required and retighten the bolts ③.
- Tighten the screws ②.
- Carry out the setting on both sides.
- By tightening or loosening the screws ④ you can adjust how easily the armrest can be pulled out or pushed in.

The distance between the mudguard and the wheel must be either < 8 mm or > 25 mm to prevent fingers from becoming caught between the wheel and the mudguard.

1

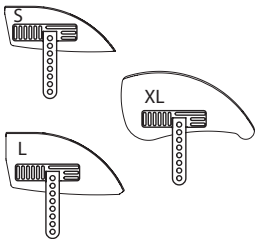


2



① → 7 Nm
② → 4 Nm
③ → 7 Nm

Mudguard size



SHh [mm]	*Hinterrad 22″*				*Hinterrad 24″*				*Hinterrad 25″*				*Hinterrad 26″*			
	1	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*
390	L	L	L	L	XL	XL	XL	XL	-	-	-	-	-	-	-	-
400	S	S	S	S	L	L	L	L	-	-	-	-	-	-	-	-
410	S	S	S	S	L	L	L	L	XL	XL	XL	XL	-	-	-	-
420	S	S	S	S	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL
430	S	S	S	S	L	L	L	L	L	L	L	L	XL	XL	XL	XL
440	S	S	S	S	L	L	S	S	L	L	L	L	XL	XL	XL	XL
450	S	S	S	S	S	S	S	S	S	S	S	S	XL	XL	XL	XL
460	-	-	-	-	S	S	S	S	S	S	S	S	XL	XL	XL	XL
470	-	-	-	-	S	S	S	S	S	S	S	S	L	L	L	L
480	-	-	-	-	-	-	-	-	S	S	S	S	L	L	L	L
490	-	-	-	-	-	-	-	-	S	S	S	S	S	S	S	S

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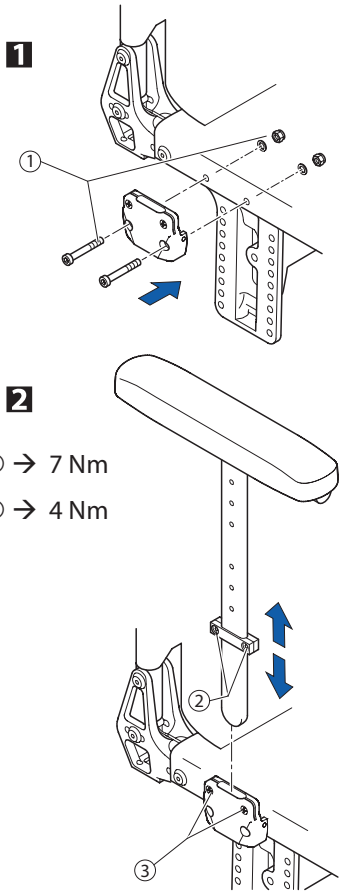
Siderest assembly and adjustment

Difficulty: ●●○ *Tools:* ⬢ 3, 4 ⬡ 10 ✖ 2

1. Attach the bracket to the seat module with the bolts and nuts ①.
2. Slightly loosen the three screws ② on the height adjustment bracket then move the siderest to the desired height.
- Tighten the screws ③.
- By tightening or loosening the screws ③, you can adjust how easily the armrest can be pulled out or pushed in.

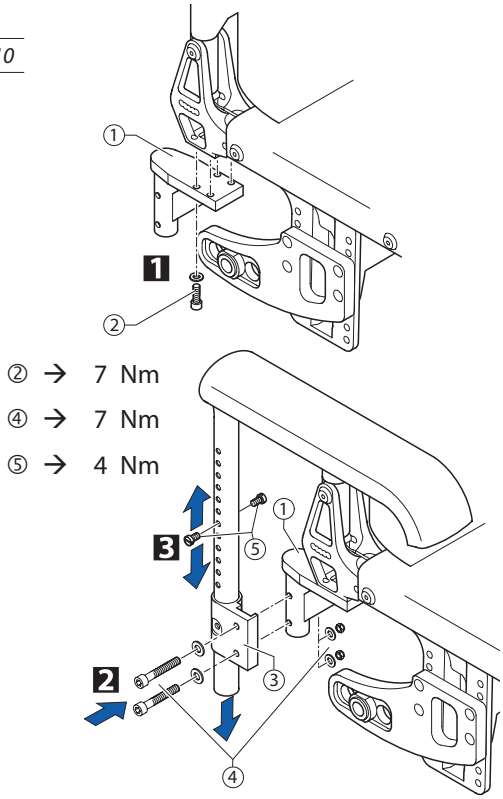
A 4° wheel camber requires that an additional set of distance plates be fitted between the adapter plate and the side profile, → Chap. Rear wheels, ‹Adapterplate spacer assembly›.



Armrest assembly and adjustment

Difficulty: ●●○ *Tools:* ⬢ 4 ⬡ 10

1. Attach the vertical adaptation support ① with the bolts ②.
2. Attach the armrest holder ③ with the bolts and nuts ④ to the vertical adaptation support ①.
3. Adjust the height of the armrest by changing the position of the screw ⑤.



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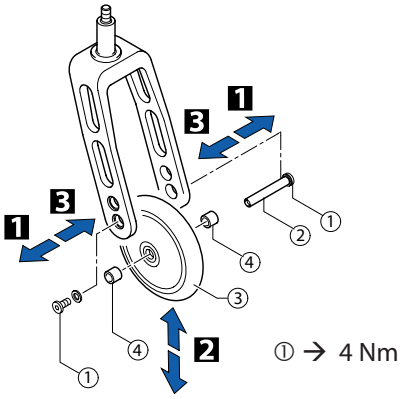
Front wheels

Replacing a front wheel

Difficulty: ●○○ *Tools:* ⬢ 2x3



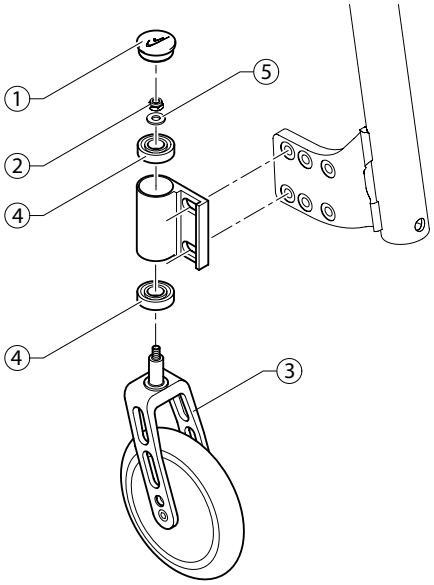
1. Remove the screw ① with disk on one side. Remove the wheel axle ②.
2. Remove the front wheel ③.
3. Place the sleeves ④ between the new front wheel ③ and the fork.
4. Slide the axle ② through the fork, sleeves ④ and the front wheel ③ and fix the axle using the screw ①. Here, use the new screw supplied with the wheel as this screw comes with a thread-locking device,
   → **Chap. Front wheels, ‹Front wheel adjustment, vertical adjustment›.**

Function control:

The wheel may not wobble, but must rotate easily.

Replacing a front wheel fork

Difficulty: ●●○ *Tools:* ⬡ 10



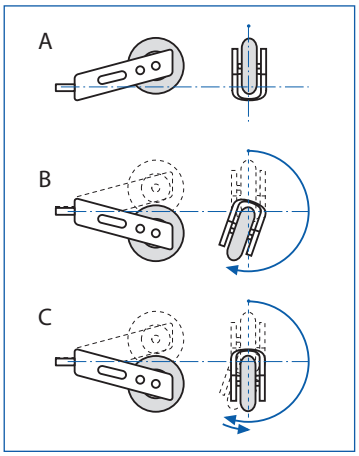
- Remove the sealing cap ① of the bearings block by inserting two screwdrivers into the grooves and flipping it off.
- Remove the nut ② with the washer ⑤.
- Remove the front wheel fork ③.
- Check the ball bearings ④ and replace them if necessary.
- Insert the new front wheel fork with the washer ⑤ and the nut ② and tighten the nut.
- Carry out the function check (see below).
- Replace the sealing cap ①.
- Check the position of the front wheel supporter,
  → **Chap. Front wheels, ‹Front wheel adjustment, vertical adjustment›.**

Function control:

Tip the wheelchair backwards by 90° so that it is lying on the backrest and the rear wheels. Turn the fork upwards (position A) and let it tip downwards.

The fork has been correctly adjusted if it easily turns to beyond the bottommost point and remains there (position B).

If the fork turns back to the lower position (position C), it has not been sufficiently tightened. There is a risk that the front wheels will start to wobble at high speeds.



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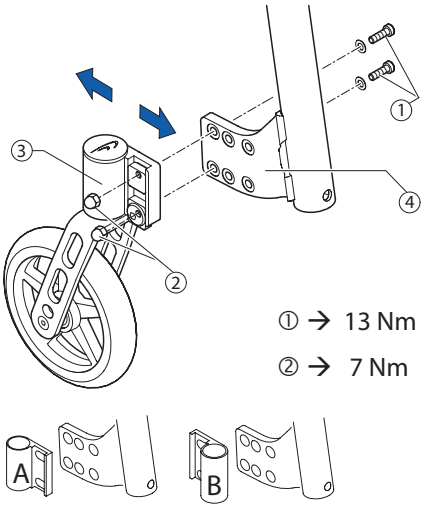
Front wheels, repositioning to the frame

The front forks can be mounted in 3 different positions on the front frame. If the distance between footplate and front wheel is too small or if the footrest is mounted in high position, only the two rearmost positions can be used. With the carbon frame and the titan frame 75° having only two pairs of holes, just the rearmost position can be used.

Difficulty: ●●● *Tools:* ⬢ 5 ⬡ 10

- Remove screws with washers ① and the nuts ②.
- Place the front wheel supporter ③ in the required position on the frame ④ then replace the screws and washers ① and the nuts ②.
- Check the position of the front wheel supporter, → **Chap. Front wheels, ‹Front wheel supporter, vertical adjustment›.**

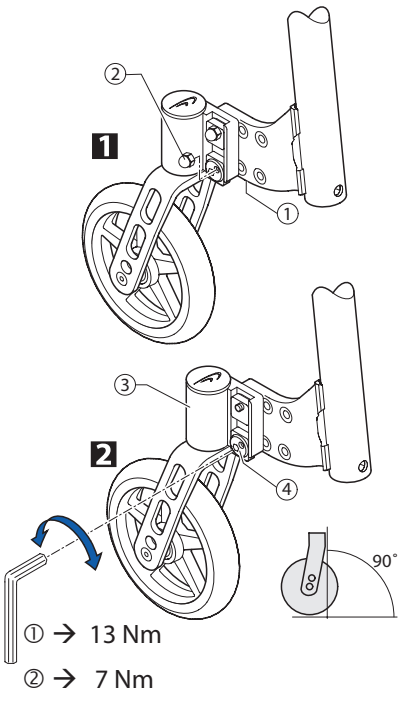
The bearing block can be fitted with the holes to the front or with the holes to the back. Fitting with the holes to the back only makes sense if there is enough space between the castor wheel and the footplate.



Front wheel supporter, adjusting the steering error angle

Difficulty: ●●● *Tools:* ⬢ 5 ⬡ 10

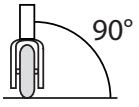
1. Remove nut ② and slightly loosen screw ①.
2. Place a spirit level against the bearing block ③ and turn the disc ④ with an allen key so that the bearing block is perpendicular to the floor.
- Tighten screw ①.
- Replace and tighten nut ②.



Front wheel supporter, adjusting the trail angle

Difficulty: ●●● *Tools:* ⬢ 5 ⬡ 10

The trial angle of the front wheels is set and fixed when assembling the frame, → **Chapter Frame, ‹Changing frame›.**



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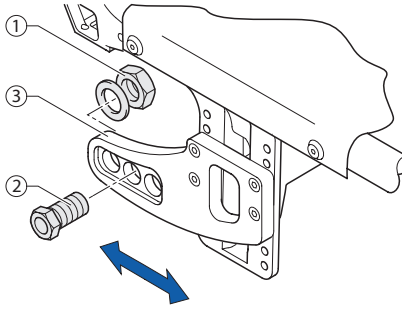
Rear wheels

Rear wheels, repositioning



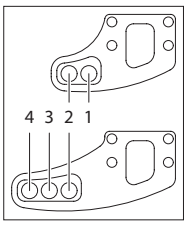
The chair will be more stable, the further rearwards that the rear wheels are fitted.

There are 2 different adapter plates available covering 4 possible rear wheel positions. If necessary replace the adapter plate, → **Chap. Rear wheels, ‹Adapterplate, adjustment to folding unit or assembly of new adpterplate›.**

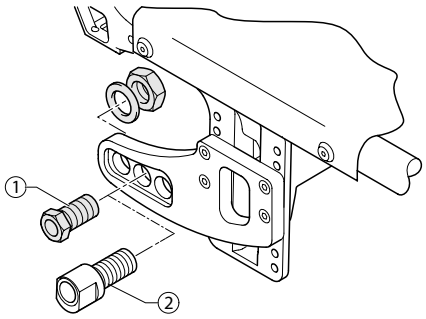
Difficulty: ●○○ *Tools:* ⬡ 22 ▬C 19

- ☐ Remove the nut ① from the adapter sleeve ②.
- ☐ Insert the adapter sleeve ② in the required hole of the adapter plate ③.
- ☐ Tighten the nut ① again.
- ☐ Carry out the same setting on both sides.

① → 35 Nm



Wheel camber, adapter sleeves



1° adapter sleeves ① or 4° adapter sleeves ② can be used. The wheel camber changes accordingly.

If 4° adapter sleeves are used, the rear wheels must subsequently be adjusted until parallel.

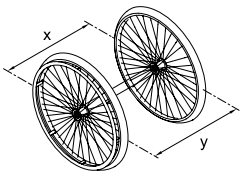
Adjustment of rear wheel parallelism

Difficulty: ●●● *Tools:* ⬡ 22 ▬C 19

- ☐ Measure the distance between the front and rear wheels at axle level.

If this distance is not the same (x ≠ y):

- ☐ Use the open-end spanner to rotate and adjust the adapter sleeves on both sides so that the distance between the front and rear wheels at axle level is identical (x = y).



If a wheelchair has been retrofitted with side parts and/or additional accessories, e.g. an antitipper, the short 1° adapter sleeve must be replaced with the long 1° adapter sleeve.

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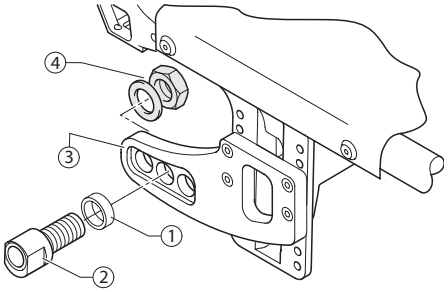
Distance sleeves

If additional side parts or another type of rear wheel is fitted or if the rear seat height is adjusted, the distance between the rear wheels may have to be increased by fitting additional distance sleeves.

Distance sleeve assembly

Difficulty: ●○○ *Tools:* ⬡ 22 ▬C 19

- Remove rear wheel.
- Loosen and remove adapter sleeve ②, nut and washer ④.
- Slide the distance sleeve ① onto the thread of the adapter sleeve ②.
- Secure the adapter sleeve to the adapter plate again using the nut and washer ④.
- In the case of a 4° wheel camber, the rear wheels must be subsequently adjusted until parallel, → **Chap. Rear wheels, ‹Adjustment of rear wheel parallelism›.**



② → 35 Nm

Adapterplate

Adapterplate, adjustment to folding unit or assembly of new adpterplate

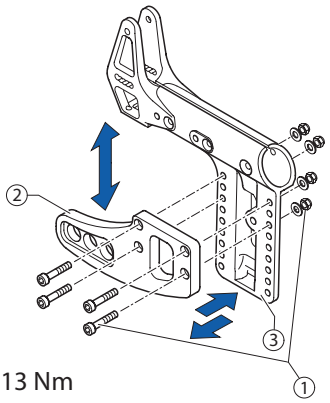
Difficulty: ●●○ *Tools:* ⬢ 5 ⬡ 10

1. Remove the 4 bolts ① from the adapter plate ②.
2. Adjust the adapter plate to the required height on the scissor axle ③. Tighten the bolts ① firmly again.
- Carry out the same setting on both sides.
- Check the position of the front wheel supporter, → **Chap. Front wheels, ‹Front wheel supporter, vertical adjustment›.**

Function control:

Check that the rear seat height is correct.

Note that a rear seat height adjustment changes the seat angle. If necessary the backrest angle can be adjusted accordingly.



① → 13 Nm

Adapterplate spacer assembly

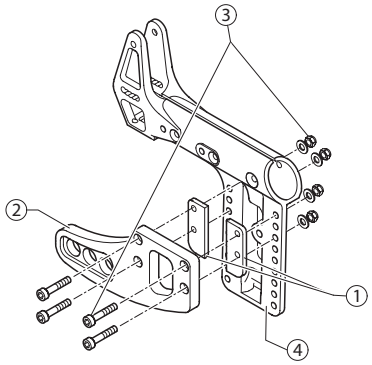
If a side rest is fitted with a 4° wheel camber, an additional set of distance plates must be fitted.

Difficulty: ●●○ *Tools:* ⬢ 5 ⬡ 10

- Remove the rear wheel.
- Loosen and remove the bolts ③ and remove the adapter plate ②.
- Insert both parts of the distance plate set ① between the adapter plate ② and the side profile.
- Secure the adapter plate ② and the distance plate set ① using the distance plate set bolts ③.

Please note that the screws of the distance plate set must be used because they are longer than the original screws.

③ → 13 Nm



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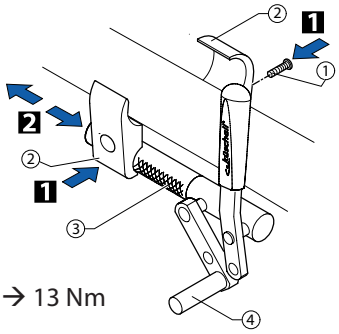
Brakes

Fitting / adjusting the parking brake

Difficulty: ●●○ *Tools:* ⬢5



① → 13 Nm

Following each positioning, the rear wheel parking brakes (e.g. when changing the wheel chamber) must be readjusted.

The parking brake function is only guaranteed if the tire has the corresponding air pressure.

- Check that the rear wheels have sufficient air.

1. Loosely fix the clamping piece ② to the frame with the screw ①.
2. Slide the brake ③ into the correct position and tighten the screw ①.

When the brake is on, the brake shoe ④ must press approx. 4 mm into the tire.

Furthermore, please note that very little force is required for activating and deactivating the brake. If necessary, a brake lever extension can be fitted.

Visual control

Check that the parking brake is correctly positioned. The brake is correctly adjusted if the brake shoe does not press more than 4 mm into the tire when the brake is on.

Function control

Place the loaded wheelchair on a ramp with a 7° slope with the parking brake on. The wheelchair must not move. Carry out this check with the wheelchair both facing down the ramp and facing up the ramp.

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Options & accessories

Antitipper

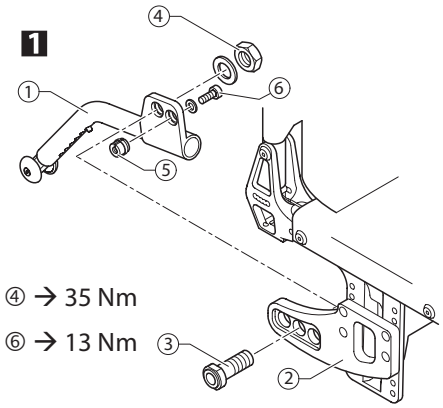
Antitipper assembly

Difficulty: ●●○ *Tools:* ⬢6 ⬡22 ▬C19

1 Remove the nut ④.

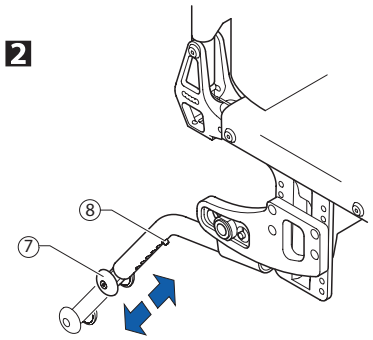
■ Mount the antitipper ① with the adapter sleeve ③, the nut ④, the sleeve ⑤ and the screw ⑥ to the adapter plate ②.

If an antitipper is newly fitted, the short adapter sleeve ③ must be replaced with a longer one in certain circumstances (only applies to 1° wheel camber).



Height adjustment

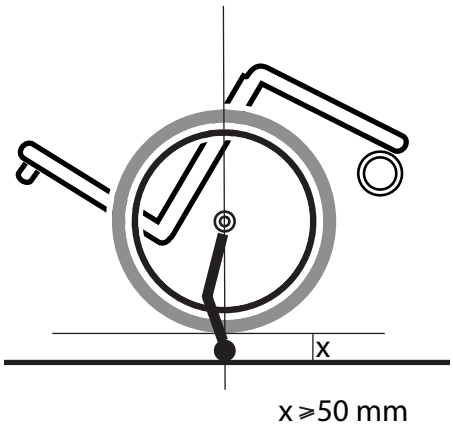
2 Press the spring pin ⑧. Slide the inner part of the antitipper ⑦ to the required position until the spring pin ⑧ locates in the correct hole.



Function control:

The distance between the antitipper and the ground must be 40 - 60 mm. It must be easy to fold up the antitipper.

Tip the wheelchair backwards using the antitipper until the axle is perpendicular to the antitipper's point of contact with the ground. In this position, the distance between the rear wheel and the ground must be at least 50 mm.



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Tipper aid

Tipper aid assembly and adjustment

Difficulty: ●●○ *Tools:* ⬢5

1 Attach the mounting block ① onto the folding unit using the 2 bolts ②.

■ Attach the horizontal adaptation support ③ to the mounting block ① using the 2 bolts ④.

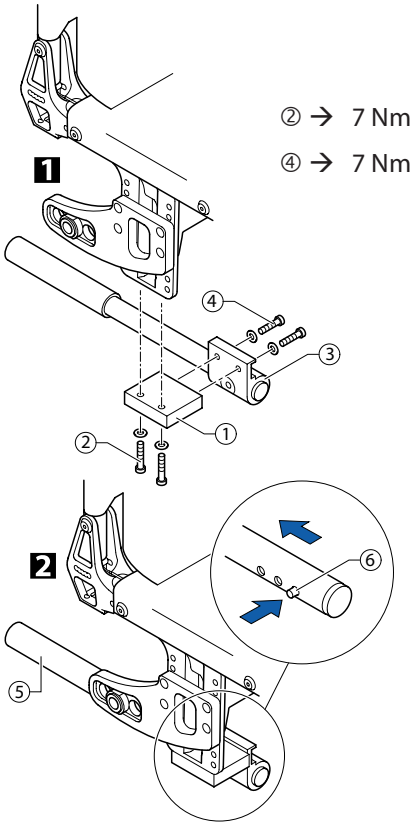
If a cane holder is mounted on the other side of the wheelchair, then an additional mounting block is needed to lower the tipper aid to prevent them clashing together when the wheelchair is folded.

2 Slide the tipper aid ⑤ into the horizontal adaptation support and fasten it with the spring clip ⑥.

Function control:

The tipper aid may not touch the floor if the wheelchair is tipped backwards.

■ If the tipper aid touches the floor remove it and change the position of the spring clip ⑥. This is done by removing the tube end cap then pushing the spring clip ⑥ one hole further into the tube using a screwdriver.



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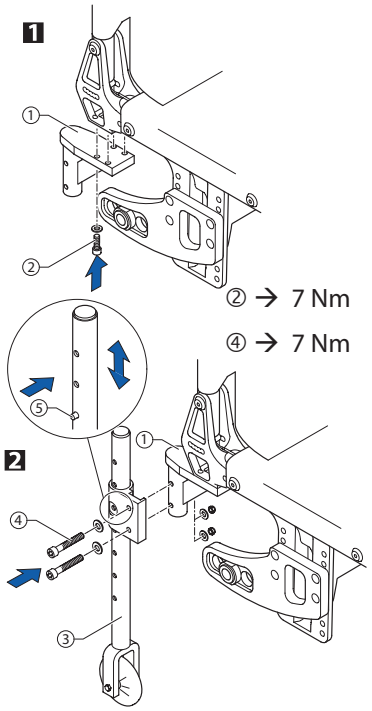
Transit wheels

Transit wheels assembly and adjustment

Difficulty: ●●○ *Tools:* ⬢4 ⬡10

1. Attach the vertical adaptation support ① to the chair with the 4 bolts ②.
2. Place the transit wheel ③ against the vertical adapter support ① and attach it with the 2 bolts ④.

■ Adjust transit wheels ③ to the correct height with the spring clip ⑤.



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Cane holder

Cane holder assembly and adjustment

Difficulty: ●●○ *Tools:* ⬢5 ✖2

1 Attach the mounting block ① onto the wheelchair using the 2 bolts ②.

■ Attach the horizontal adaptation support ③ to the mounting block ① using the 2 bolts ④.

If a tipper aid is mounted on the other side of the wheelchair, then an additional mounting block is needed to lower the cane holder to prevent them clashing together when the wheelchair is folded.

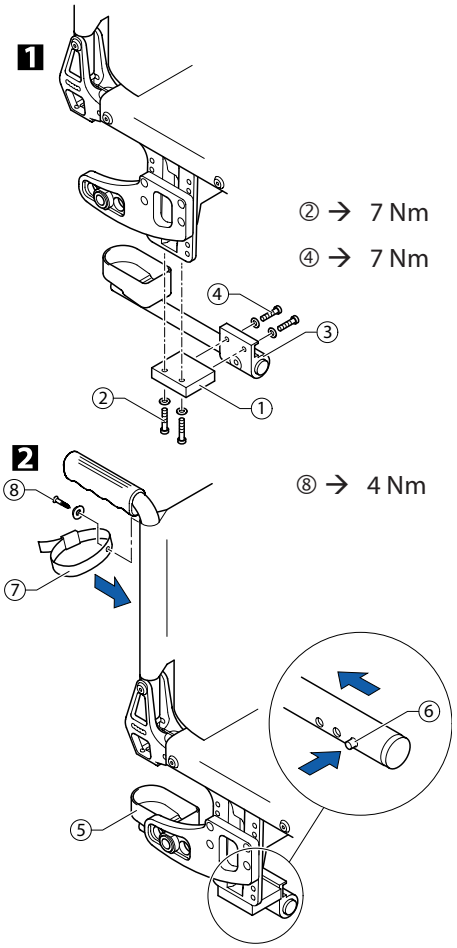
2 Slide the cane holder ⑤ into the horizontal adaptation support ③ and fasten it with the spring clip ⑥.

■ Remove the screw ⑧ from the backrest cover then replace it together with the strap ⑦.

Function control:

The cane holder must not touch the floor when the wheelchair is tipped backwards.

■ If the cane holder touches the floor remove it and change the position of the spring clip ⑥. This is done by removing the tube end cap then pushing the spring clip ⑥ one hole further into the tube using a screwdriver.



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